#### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

#### MEMORANDUM

DATE:

November 11, 2011

TO:

Chris Lanane, Scott Weaver

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Lizard Tail, November 11, 2011," for your review. Please refer any comments you may have on the document to me by January 11, 2012. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

# Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

#### <u>SITE:</u> LIZARD TAIL

Report Date: November 11, 2011 Prepared by: Mike S. Horn

#### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Lizard Tail was audited on November 9, 2011. The audit was conducted by Mike Horn and was witnessed by Scott Weaver, who is the site operator.

#### 2.0 Parameters Audited:

#### T.E.O.M. PM-10

#### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

#### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

Lizard Tail Audit Report November 11, 2011 Page 3

APPENDIX A

## Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) ${\bf AUDIT}$

Date of report:	11/11/11					
Date:	11/9/11			Site name: I	izard Tail	
Start:	14:00hrs. PS	ΣT		Operator: S	Scott Weaver	
Finish:	14:20hrs. PS	T		Project: S	SB 270	
Audited By:	Mike Horn			Site Elevation:	3603	ft.
Witness:	Scott Weaver			Amb. Pres.:	904.30	hPa
				Amb. Temp.:	19.2	deg. C
Prop. or Serial No.:	24983			Make:	R & P	
Туре:	PM-10			Model:	1400ab	
				Last cal. date:	9/22/11	
	AUD	IT DEVICE(S)				
Make: 1	BGI Incorporated			Make: I	BGI Incorporated	
Model: 1	DELTA CAL			Model: I	DELTA CAL	
S/N:	525			S/N:	525	
Range:	2 - 20 lp	m		Range:	2 - 20	lpm
	Calibration Factors			_(	Calibration Factor	rs
Slope:	1.00			Slope:	1.00	
Intercept:	0.00			Intercept:	0.00	
Cal date:	1/4/11			Cal Date:	1/4/11	
	Main:	Aux:	Sampler temp:	<u>Diff.</u>	Sampler press:	Diff.
Leak check:	0.060	0.380	18.9	-0.3	898.53	-5.8
Dark current:	N/A	N/A				
(	Qa=[dPxTa/Pa] <sup>1/2</sup> +b	)	Site		Nomina	l Flow Rates
Audit	Audit Flow	v Rate,	Flow Rate	Diff.	Lower Limit	<b>Upper Limit</b>
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	16.88	16.88	16.63	-1.5	15.0	18.4
Bypass/Aux Flow Rate	13.73	13.73	13.64	-0.7		
Main Flow Rate	3.04	3.04	2.99	-1.6	2.7	3.3
<b>Total Flow Rate</b>	16.83	16.83	16.63	-1.2	15.0	18.4

Comments: None.

#### TABLE A-1

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measuremen	nt Variable	Evaluation Criteria
Wind Speed		At ws $\leq$ 5 m/s, input $\pm$ 0.25 m/s; At ws $>$ 5 m/s, input $\pm$ 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direct	ion	input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatur	e	input $\pm$ 0.5° C Gravimetry Lab $\pm$ 1.0 deg. C input $\pm$ 2.0° C for PM-10, PM-2.5 samplers
Relative Hu	midity	Ambient: input $\pm$ 5% RH, $\pm$ 1.5°C as dew point Gravimetry Lab: input $\pm$ 5%
Precipitation	1	input ± 10%
Barometric 1	Pressure	Ambient: input ± 10 hPa TEOM: ± 10 mm mercury
PM-10: Hi-V PM-2.5	Vol SSI, Partisol, BGI,	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 4%; Design Flow $\pm$ 5%
TEOM:	Total Flow Main Flow Bypass Flow	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM

Bypass Flow: < 0.60 LPM

#### Appendix B

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

#### **AUDIT DEVICE**

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1,0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CU10, HS10	8/30/11	N/A	N/A
Psychro-Dyne Psychrometer:	RH 04	N/A	1 0	
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

		apered	Element Osci	nating Microba	alance (TEOM		
	1	· T	FLC	DW AUDIT			
		-			-		
Date	Wedle	+		Site Name	1 200	1-1	
Start		PST		Operator		y dace	
Finish		PST			: SB270	Klaver	
	1-1-20	1		Site Elevation		6	
		·	1	Amb. Press.		ft in. Hg	
				Amb. Temp.		deg. C	
			T	1	14.1	ueg. o	
Prop. Or Ser. No.:				Make	R&P		
Type:	PM10			Model	1400g		
		8		Last Cal. Date	9/2011	1	
					1000/1		
			Device(s)			1	
Make:	LISTA I PRESENT	PORAT	ED	Make:		RPORATED	
Model:	DELTA CAL	1		Model:	DELTA CAL		
S/N:	0123 575	,		S/N:	0123		
Range: Calibration factors:	2 - 20	lpm		Range:	2 - 20	lpm	
			Calib	ration factors:			
Slope:	1.0			Slope:	1.0		
Int.: Cal Date:	0,0,			Int.:	0.0		
Cai Date:	14,4/16			Cal Date:			
O =====	PxT <sub>a</sub> /P <sub>a</sub> J <sup>1/2</sup> +b		A 14'4	I			
Ga-inta	PXI JP J +D		Altitude Corre	ection Factor:	÷1013		
Leak Check-Initial	Main						
Leak Check-Final	Main: Main:	06	Aux:	,38			
	iviairi.		Aux:				
			Site		Name 1 1 E		
Audit	Audit Flow	Rate	Flow Rate	Diff.	Nominal F	low Rates	
Point		VLPM)	(VLPM)	(%)	Lower Limit (LPM)		
Total Fow Rate	16.88		299/12			(LPM)	
Aux. Flow Rate	13 77		17/11/5	.645/6	3 15.0	18.4	
Main Flow Rate	3 00		2.99		2.7	3.3	
Total Flow Rate	16.83				15.0	18.4	
	1.020		16.63			10.4	
			Stand	dard			
····	Sampler		True	Raw			
Amb Temp	18.9			199			
Amb Press	. 887		898.53	9043		·	
				1-1-1			
				V			
Comment							
Comments:							
						(NOV) = / NOV = (NOV)	
	1)	1					
			·				

#### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

#### MEMORANDUM

DATE:

July 7, 2011

TO:

Chris Lanane, Scott Weaver

FROM:

Mike Horn/

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Lizard Tail, July 7, 2011," for your review. Please refer any comments you may have on the document to me by September 7, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

# Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

#### <u>SITE:</u> LIZARD TAIL

Report Date: July 7, 2011 Prepared by: Mike S. Horn

#### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Lizard Tail was audited on July 6, 2011. The audit was conducted by Mike Horn and was witnessed by Scott Weaver, who is the site operator.

#### 2.0 Parameters Audited:

T.E.O.M. PM-10

#### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

#### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

#### Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	7/7/11					
Date:	7/6/11			Site name: I	Lizard Tail	
Start:	13:15hrs. P	ST		Operator: S	Scott Weaver	
Finish:	13:L35hrs. P	ST		Project: S	SB 270	
Audited By:	Mike Horn			Site Elevation:	3603	ft.
Witness:	Scott Weaver			Amb. Pres.:	893.60	hPa
				Amb. Temp.:	33.9	deg. C
Prop. or Serial No.:	24983			Make:	R & P	
Туре:	PM-10			Model:	1400ab	
				Last cal. date:	6/8/11	
	AUL	OIT DEVICE(S)				
Make:	BGI Incorporated			Make: I	BGI Incorporated	
Model:	DELTA CAL			Model: I	DELTA CAL	
S/N:	525			S/N:	525	
Range:	2 - 20 lp	om		Range:	2 - 20	lpm
	Calibration Factors				Calibration Factor	rs
Slope:	1.00			Slope:	1.00	
Intercept:	0.00			Intercept:	0.00	
Cal date:	1/4/11			Cal Date:	1/4/11	
	Main:	Aux:	Sampler temp:	<u>Diff.</u>	Sampler press:	Diff.
Leak check:	0.100	0.380	32.8	-1.1	890.43	-3.2
Dark current:	N/A	N/A				
	$Qa = [dPxTa/Pa]^{1/2} +$	b	Site		Nomina	l Flow Rates
Audit	Audit Flo	w Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	16.46	16.46	16.63	1.0	15.0	18.4
Bypass/Aux Flow Rate	13.46	13.46	13.64	1.3		
Main Flow Rate	2.93	2.93	2.99	2.0	2.7	3.3
Total Flow Rate	16.39	16.39	16.63	1.5	15.0	18.4

Comments: None.

#### TABLE A-1

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measureme	nt Variable	Evaluation Criteria
Wind Speed		At ws $\leq$ 5 m/s, input $\pm$ 0.25 m/s; At ws > 5 m/s, input $\pm$ 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direct	ion	input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatur	re	input $\pm$ 0.5° C input $\pm$ 2.0° C for PM-10, PM-2.5 samplers
Relative Hu	midity	Ambient: input $\pm$ 5% RH, $\pm$ 1.5°C as dew point Gravimetry Lab: input $\pm$ 5%
Precipitation	ı	input ± 10%
Barometric	Pressure	Ambient: input ± 10 hPa TEOM: ± 10 mm mercury
PM-10: Hi-Y PM-2.5	Vol SSI, Partisol, BGI,	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 4%; Design Flow $\pm$ 5%
TEOM:	Total Flow Main Flow Bypass Flow	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10%

Leak Check

TEOM:

Main Flow: < 0.15 LPM

Bypass Flow: < 0.60 LPM

#### Appendix B

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

#### **AUDIT DEVICE**

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

		apered	Element Osci	llating Microba	alance (TEOM)		
			FLO	TIDUA WC		s samuanista aa	77 3 N3 8 6 V
		_		-		,	
Date	1/6/11			Site Name	· San and	1-1	
Start	113/13	PST		Operator	1 ARABIACIA	day	
Finish	13 35	PST			: SB270	Keaver	
	11111			Site Elevation	:	ft	
				Amb. Press.	: 493.6	in. Hg	
				Amb. Temp.	33.9	deg. C	
Prop Or Sor No.	111000	-				7)	
Prop. Or Ser. No.:	PM10				: R&P		
туре.	17 10 10			Last Cal. Date:	1400a/		
	11			Last Cal. Date	6/8/1		
		Audit	Device(s)	<del>                                     </del>	1	ļ	
Make:	BGI INCOR	PORAT	ren	Make:	BGI INCOM	DDODATED	
Model:	DELTA CAL	-WALL	1	Model:	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	KURATEU	
S/N:	DELTA CAL	5		S/N:	DELLIN LAND	T	
Range:	2 - 20	lpm		Range:	2 - 20	Ipm	
Calibration factors:			Calib	ration factors:			
Slope:	1.0			Slope:	1.0		
Int.: Cal Date:	0,0			Int.:	0.0-		
Cai Date:	14.4/11			Cal Date:			
	PxT <sub>2</sub> /P <sub>2</sub> J <sup>1/2</sup> +b	-	A leie	I			
	TAIR/FE TD		Alutude Corr	ection Factor:	÷1013		
Leak Check-Initial	Main:	10	Aux:	nd			
Leak Check-Final	Main:	.10	Aux:	, 5.0			
			Site		Nominal FI	ow Rates	
Audit	Audit Flow		Flow Rate	Diff.	Lower Limit	Upper Limit	
Point	delta P	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)	
Total Fow Rate	16.46		2.99/13.	64-16	315.0	18.4	
Aux. Flow Rate Main Flow Rate	13:46		13.64				
Total Flow Rate	12720		7:79		2.7	3.3	
Total How Rate	12.5		16:63		15.0	18.4	
			Stan	dard			
· · · · · · · · · · · · · · · · · · ·	Sampler	-	True	Raw			
Amb Temp	32.8	2		33 9			
Amb Press	. 879		890.43	893 1			
				10.4			
					70		
Comments:							
					1		1
	7						

#### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

#### MEMORANDUM

DATE: April 21, 2011

TO: Chris Lanane, Scott Weaver

FROM: Mike Horn //

SUBJECT: Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Lizard Tail, April 21, 2011," for your review. Please refer any comments you may have on the document to me by June 21, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

# Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

#### SITE: LIZARD TAIL

Report Date: April 21, 2011 Prepared by: Mike S. Horn

#### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Lizard Tail was audited on April 20, 2011. The audit was conducted by Mike Horn and was witnessed by Scott Weaver, who is the site operator.

#### 2.0 Parameters Audited:

T.E.O.M. PM-10

#### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

#### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

Lizard Tail Audit Report April 21, 2011 Page 3

APPENDIX A

## Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) $AUD\Pi \Gamma$

Date of report:	4/21/11					
Date:	4/20/11			Site name:	Lizard Tail	
Start:	13:25hrs. PS			Operator: S	Scott Weaver	
Finish:	13:45hrs. PS7	Γ		Project: 9	SB 270	
Audited By:	Mike Horn			Site Elevation:	3603	ft.
Witness:	Scott Weaver			Amb. Pres.:	886.40	hPa
				Amb. Temp.:	25.6	deg. C
Prop. or Serial No.:	24983			Make:	R & P	
Type:	PM-10			Model:	1400ab	
				Last cal. date:	3/17/11	
	AUDIT	Γ DEVICE(S)				
Make:	BGI Incorporated			Make: 1	3GI Incorporated	
Model:	DELTA CAL			Model: 1	DELTA CAL	
S/N:	525			S/N:	525	
Range:	2 - 20 lpm	າ		Range:	2 - 20	lpm
	Calibration Factors				Calibration Factor	'S
Slope:	1.00			Slope:	1.00	
Intercept:	0.00			Intercept:	0.00	
Cal date:	1/4/11			Cal Date:	1/4/11	
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.
Leak check:	0.050	0.380	25.2	-0.4	883.34	-3.1
Dark current:	N/A	N/A				
(	$Qa = [dPxTa/Pa]^{1/2} + b$		Site		Nominal	Flow Rates
Audit	Audit Flow	Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	16.49	16.49	16.63	0.8	15.0	18.4
Bypass/Aux Flow Rate	13.36	13.36	13.64	2.1		
Main Flow Rate	2.91	2.91	2.99	2.7	2.7	3.3
Total Flow Rate	16.46	16.46	16.63	1.0	15.0	18.4

Comments: None.

#### TABLE A-1

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measureme	ent Variable	Evaluation Criteria
Wind Speed	<b>1</b>	At ws $\leq$ 5 m/s, input $\pm$ 0.25 m/s; At ws $>$ 5 m/s, input $\pm$ 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direc	tion	input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatur	re	input $\pm0.5^{\circ}$ C input $\pm2.0^{\circ}$ C for PM-10, PM-2.5 samplers
Relative Hu	midity	Ambient: input $\pm$ 5% RH, $\pm$ 1.5°C as dew point Gravimetry Lab: input $\pm$ 5%
Precipitation	n	input ± 10%
Barometric	Pressure	Ambient: input ± 10 hPa TEOM: ± 10 mm mercury
PM-10: Hi- PM-2.5	Vol SSI, Partisol, BGI,	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 4%; Design Flow $\pm$ 5%
TEOM:	Total Flow Main Flow Bypass Flow	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM

Bypass Flow: < 0.60 LPM

Appendix B

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

#### **AUDIT DEVICE**

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

9

7	aperor	Floment Oca	illatina Mina	plane (TEA		
	apered	Element Osc	illating Microba	alance (TEOM	)	
		FLO	DW AUDIT			
111	_			0	1	
	<i></i> .		Site Name	= Juan	Jack	
1 2 4 4 1 1			Operator	r: 10077		
13.45	PST		Project	t: SB270	Lucio C	
1011			Site Elevation	1:	ft	
	1		the same of the sa	0 0 0 101		
	+		Patto. Temp.	1500	deg. C	
211902		<del></del>	86-1	Den	-	
DM10		1				
1. 101.10	-					
	-		Last Cal. Date	3/7/4		
		1		1771		
	PORAT	ED.	Make:	BGT THEO	RPORATED	<u> </u>
DELTA CAL			Model:	DEL TA CA	WINSTED	
0123 5	15			DILLIA VA	1	
	-	T		-0160-	Inm	
	1	Calib	ration factors	2 - 20	ribiti	
7 0		Call	STATE OF THE OWNERS WHEN THE PARTY NAMED IN			
The second second		<b> </b>				
-0/0/-		<del> </del>		0.0		
-14, 4/1/	1		Cal Date:		ń	
415			1			
PxT_/P_]""+b		Altitude Corr	ection Factor:	-1013		
			1			
Main:	.05	Aux:	.28			
Main:	7					_
		Site		Nominal E	Det Bet	
Audit Flow	Rate	THE RESERVE AS A SECOND	Diff			
				Lower Limit		
1/ 1/01	( * 12.1 141)	0 0 9 TIZ	(70)			
18.47		297/13	647 /6V	3 15.0	18.4	
13.836		13.64				
2.7/2		2.97		2.7	3.3	
16.46		16,63		15.0	18.4	
					****	
		Stan	dard		-	
Sampler		True				
25,7			11/			
4-92		882 71	8801			
01		9.0.2.04	U08.4			
——— <del> </del>						
						***
					-	
	1					
				-		
				<u> </u> -		
	#/26/11 /3/25 /3/25 /3/25 /3/25 /3/25 /3/45 PM10 BGI_INCOR DELTA CAL 0123 - 52 2 - 20 1 0 - 0 1 / 4 / 4/ PXT <sub>2</sub> /P <sub>2</sub> J <sup>3/2</sup> +b Main: Main:	Tapered    1/3/15   PST     1/3/15   PST     1/3/15   PST     1/3/15   PST     1/4/16     Audit     BGI INCORPORAT     DELTA CAL     0123   52 5     2 - 20   Ipm     1.0     0/0	Tapered Element Osc FLO	Tapered Element Oscillating Microb FLOW AUDIT  Site Name Operator PST Operator Site Elevation Amb. Press Amb. Temp  Audit Device(s)  BGI INCORPORATED Make OPELTA CAL Model OPELTA CAL Model OPELTA CAL S/N 2 - 20 Ipm Calibration factors:  1 0 Calibration factors:  1 0 Altitude Correction Factor:  Main: 05 Aux: 25  Main: Aux: 35  Main: Aux: 51  Site Audit Flow Rate Flow Rate Diff. delta P (VLPM) (VLPM) (%)  Cal Standard Sampler True Raw  Standard Sampler True Raw	Site Name:   Site Name:   Site Name:   Site Elevation:   Amb. Press.:   8 8 / 4   Amb. Temp.:   2 5 / 6	Site Name:   Sit

#### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

#### MEMORANDUM

DATE:

January 19, 2011

TO:

Chris Lanane, Scott Weaver

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Lizard Tail, January 19, 2011," for your review. Please refer any comments you may have on the document to me by March 21, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

# Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

#### SITE: LIZARD TAIL

Report Date: January 19, 2011 Prepared by: Mike S. Horn

#### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Lizard Tail was audited on January 18, 2011. The audit was conducted by Mike Horn and was witnessed by Scott Weaver, who is the site operator.

#### 2.0 Parameters Audited:

T.E.O.M. PM-10

#### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

#### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

Lizard Tail Audit Report January 19, 2011 Page 3

APPENDIX A

#### Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	1/19/11					
Date:	1/18/11			Site name: I	Lizard Tail	
Start:	14:25hrs. PS	Γ		Operator: S	Scott Weaver	
Finish:	14:40hrs. PS	Γ		Project: 9	SB 270	
Audited By:	Mike Horn			Site Elevation:	3603	ft.
Witness:	Scott Weaver			Amb. Pres.:	893.10	hPa
				Amb. Temp.:	19.6	deg. C
Prop. or Serial No.:	24983			Make:	R & P	
Туре:	PM-10			Model:	1400ab	
				Last cal. date:	12/7/10	
	AUDI	Γ DEVICE(S)				
Make:		Make: BGI Incorporated				
Model: DELTA CAL				Model: DELTA CAL		
S/N:	525			S/N:	525	
Range:	2 - 20 lpn	n		Range:	2 - 20	lpm
	Calibration Factors			(	Calibration Factor	'S
Slope:	1.00			Slope:	1.00	×
Intercept:	0.00			Intercept:	0.00	
Cal date:	1/4/11			Cal Date:	1/4/11	
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.
Leak check:	0.050	0.320	19.4	-0.2	890.43	-2.7
Dark current:	N/A	N/A				
	$Qa=[dPxTa/Pa]^{1/2}+b$		Site		Nominal	Flow Rates
Audit	Audit Flow Rate,		Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	16.49	16.49	16.63	0.8	15.0	18.4
Bypass/Aux Flow Rate	13.46	13.46	13.64	1.3		
Main Flow Rate	3.00	3.00	2.99	-0.3	2.7	3.3
<b>Total Flow Rate</b>	16.46	16.46	16.63	1.0	15.0	18.4

Comments: None.

#### TABLE A-1

#### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measureme	nt Variable	Evaluation Criteria		
Wind Speed		At ws $\leq$ 5 m/s, input $\pm$ 0.25 m/s; At ws $>$ 5 m/s, input $\pm$ 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H		
Wind Direction		input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor		
Temperature		input $\pm$ 0.5° C input $\pm$ 2.0° C for PM-10, PM-2.5 samplers		
Relative Humidity		Ambient: input $\pm$ 5% RH, $\pm$ 1.5°C as dew point Gravimetry Lab: input $\pm$ 5%		
Precipitation		input $\pm 10\%$		
Barometric Pressure		Ambient: input $\pm$ 10 hPa TEOM: $\pm$ 10 mm mercury		
PM-10: Hi-Vol SSI, Partisol, BGI, PM-2.5		input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 4%; Design Flow $\pm$ 5%		
TEOM:	Total Flow Main Flow Bypass Flow	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10%		
TEOM:	Leak Check	Main Flow: < 0.15 LPM		

Bypass Flow: < 0.60 LPM

#### Appendix B

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

#### AUDIT DEVICE

	Serial #	Cal Date:	Slope:	Intercept:	
BGI Delta CAL:	123	12/22/09	1.0	0.0	
BGI Delta CAL:	525	1/4/11	1.0	0.0	
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209	
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0	
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A	
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518	
Texas Electronics FC-525 Precipitation:	52202	N/A			

		apered	Element Osci	llating Microba	alance (TEOM)		
			FLC	OW AUDIT		o range as a	
							T T
					0 .	1	
Date:				Site Name	Logare	L Zail	
Start:		PST		Operator	: Laute	Weaver	
Finish:	14.40	PST			: SB270		
				Site Elevation		ft	† <u>+</u>
	10			Amb. Press.	893 /	in. Hg	
				Amb. Temp.	: 196	deg. C	
Prop. Or Ser. No.:		4			: R&P		
Туре:	PM10				: 1400a		
		36)		Last Cal. Date:	12/7/10		
					1170		
			Device(s)				
Make:	BGI INCOM	RPORAT	ED	Make:		RPORATED	
Model:	DELTA CAL	- 5		Model:	DEL TA CAI		
S/N:	0123 - 5	15		S/N:	0123		
Range:	2 - 20	lpm		Range:	2 - 20	lpm	
Calibration factors:			Calib	ration factors:			
Slope:	1.0			Slope:	1.0		
Int.:	0,91	-		Int.:	0.0		
Cal Date:	11,4,11	1	ļ	Cal Date:		f	
	D T = 102		ļ	L			
Q <sub>a</sub> =m[d	$PxT_a/P_aJ^{1/2}+b$		Altitude Corr	ection Factor:	÷1013		
1-1-01-11-11-1							
Leak Check-Initial	Main:	.05		.32			
Leak Check-Final	Main:		Aux:				
Audit	Audit Fl	D-4	Site		Nominal F		
Point	Audit Flow delta P	(VLPM)	Flow Rate	Diff.	Lower Limit		
Total Fow Rate	IZ IZ C	(VLPIVI)	A COST	(%)	(LPM)	(LPM)	
Aux. Flow Rate	6.47		299/13	64- 16.6	3 15.0	18.4	
Main Flow Rate	13.46		13.64				
	3.00		2.17		2.7	3.3	
- Total Tion Trace	16,46		16.63		15.0	18.4	
			Stan	daud			
	Sampler		True	Raw			
Amb Temp	19.4		iiue	19 /			
Amb Press	879		890.43	893.1			L
	-0-/-/		010.42	0/2./			
	i						
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		-					
	11-11-11-11-1						
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Comments:				=			
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